

## REMARKS

### Amendments

Independent claim 1 has been amended to recite the additional process step of separating the effluent from the contacting step (a) into a heavy (high boiling) fraction and a light (low boiling) fraction wherein the heavy fraction is subjected to the pour point reducing step. Support for this amendment may be found in the specification at page 11, lines 1-8 and page 15, lines 10-13.

Claim 1 has also been amended to recite a range for the large pore molecular sieve component of the sulphided, non-fluorided hydrodesuphurisation catalyst to be present therein that is in the range of from 0.1 to 8 wt%. As a result of this amendment to claim 1, claim 14 has been canceled. Further support for this limitation is found in the specification at page 8, lines 7-12.

Dependent claim 2 is amended to recite the proper antecedent.

Dependent claims 12, 15, 16, and 17 are amended to make certain changes that are required as a result of the amendments to claim 1.

### The Baker et al. (US 5,951,848) Reference

The Baker patent discloses a process for catalytically dewaxing a feedstock by using a catalyst system comprising two different types of catalysts that synergistically act together. *See, e.g.,* abstract. The catalyst system includes a high activity hydrotreating catalyst that is placed upstream of a dewaxing catalyst with, preferably, both catalysts being contained in a single vessel so as to create a synergistic catalyst system. *See* column 2, lines 46-60; column 3, lines 16-20, 27-30, 61-64; column 8, lines 17, 42-49. Baker describes hydrocracking catalysts, *see* column 5, line 62 – column 7, line 39, and Baker states that the primary difference between hydrotreating and hydrocracking is in the degree of boiling range conversion of the heavy hydrocarbons to below 650°F boiling range products, but there are other differences between the two that are noted as well by Baker. *See* column 7, lines 57-column 8, line 6.

The high activity hydrotreating catalyst of the Baker inventive process preferably contains platinum or palladium in the amount ranging from 0.1% to 5 wt.%. *See* column 8, lines 49-60. The support is a porous, amorphous metal oxide with a silica-alumina combination with low acid

activity being acceptable. *See* column 8, lines 63-66. The hydrotreating catalysts used in the examples was a Pt-Pd on SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub>. *See* column 13, lines 39-44 (Example 3); column 14, lines 39-42 (Example 4); column 15, lines 60-63 (Example 5); column 16, lines 7-10 (Example 6). The hydrotreating catalyst can be one that contains Group VII and Group VIII metals, but these catalysts are less desired generally because they have lower activity than noble metal catalysts. *See* column 8, lines 53-56.

Baker describes a hydrocracking catalyst as being an amorphous bifunctional catalyst that is a combination of base metals with one selected from Group VIII metals in combination with one selected from Group VIB metals. *See* column 4, lines 60-61; column 5, line 62 – column 6, line 22. The metal is supported on a porous, amorphous metal oxide that normally has a minimum pore size of about 50 Angstroms. *See* column 6, lines 22-58. The hydrocracking catalyst may be promoted with fluorine with alumina-based hydrocracking catalysts typically requiring fluorine promotion and silica-alumina or zeolitic based hydrocracking catalysts not generally requiring fluorine addition. *See* column 6, lines 58-65. The metals may be sulfided. *See* column 7, lines 28-32.

The Baker patent appears to be suggesting that the hydrocracking step is used to pretreat the feed that is processed in the synergistic catalyst system of Baker's dewaxing process, which system includes the high activity hydrotreating catalyst and dewaxing catalyst. *See* column 4, lines 59-62; column 7, line 57-60; column 8, lines 17-21, 42-67. Thus, the high activity hydrotreating catalyst of the Baker process is placed in between a hydrocracking catalyst, if used to pretreat the feedstock, and the dewaxing catalyst.

### **The Chen et al. (US 6,723,297) Reference**

The Chen patent teaches a particular amorphous silica-alumina, a process for making the amorphous silica-alumina, and a carrier complex. *See e.g.*, the claims and throughout the specification. The carrier complex comprises the amorphous silica-alumina and may further include a crystalline compound such as a zeolite and alumina. *See e.g.*, column 7, lines 8-45. The crystalline compound of the carrier complex may be selected from zeolite-Y, zeolite-β, zeolite-ZSM, zeolite-SAPO, etc. *See* column 7, lines 52-57. The carrier complex may be used to support a hydrogenation metal component. *See* column 9, lines 38-40. The carrier complex may be used in the preparation of a hydrocracking-type catalyst or a hydrotreating-type catalyst. *See* column 9,

lines 40-59. When the carrier complex is used for a hydrotreating catalyst the active metal is preferably selected from Groups VIB and VIII metals, and more preferably the active metal is molybdenum and/or tungsten and cobalt and/or nickel. *See* column 9, lines 53-59. The Group VIB metal component can be present in the range of from 10-40 wt % and the Group VIII metal component can be present in the range of from 1-20 wt %. *See* column 10, lines 24-48.

**§103(a) rejection of claims 1 and 2 over Baker, Jr. et al. (US 5,951,848) in view of Toba et al. in *Journal of Materials Chemistry* (1994, vol. 4, no. 7, pp 1131-1135) and Chen et al. (US 6,723,297).**

It is respectfully submitted that the subject matter of claims 1 and 2, before the amendments thereof, is patentably distinct over the Examiner's cited combination of three references due to the many significant differences between the claimed subject matter and the teachings of the references. But, moreover, the amended claims that include an additionally recited step of "separating" an effluent that is yielded from the "contacting" step have further limitations that distinguish the claimed subject matter over the teachings of the cited references.

The Examiner has cited the Baker patent as the primary teaching reference. The Applicant respectfully suggests that the Examiner's characterization of the Baker teachings is somewhat in error and asks reconsideration of the rejection in view of the amendments to the claims and the remarks made herein concerning the teachings of the cited prior art. The Examiner is correct to note that the teachings of Baker concerning the hydrotreating catalyst component of the taught synergistic catalyst system of the Baker dewaxing process do not explicitly disclose that alumina is present nor does Baker disclose the surface area of its hydrotreating catalyst, but there are additional differences not noted by the Examiner.

The Baker patent, as noted above, teaches that its hydrotreating catalyst comprises a base metal that is supported on a non-acidic or low acid activity inorganic support. *See* Baker at column 8, lines 1-4, 63-67; column 13, lines 42-44 of Example 3; and claim 1. The hydrotreating catalyst must have sufficient activity at the operating temperature of the dewaxing catalyst in order to permit the preferred practice of the invention of using a single reactor vessel to contain the synergistic catalyst system. *See* Baker at column 8, lines 46-49. Baker explicitly states that the preferred hydrotreating catalyst of its invention contains noble metals such as platinum or palladium. *See* Baker at column 8, lines 49-53. The Baker patent does not teach that its

hydrotreating catalyst may contain a Group VI ( e.g., tungsten) metal component. Rather, Baker states that catalysts containing Group VII (i.e., Mn, Tc, and Re) and Group VIII metals can be used but that they are less desired generally because they have lower activity than noble metal catalysts. *See* Baker at column 8, lines 53-56. Baker teaches that the noble metals content of its hydrotreating catalyst is in the range of from 0.1% to 5 wt.% with a preferred ratio of platinum-to-palladium between 2:1 and 1:5. *See* Baker at column 8, lines 56-60.

The significance of the teachings of the Baker patent is that there is no teaching that its hydrotreating catalyst may contain tungsten. Moreover, the Baker teachings are against the use of a hydrotreating catalyst that contains a Group VIII metal, but, instead, they express the preference for the use of a noble metal hydrotreating catalyst. Thus, Baker actually teaches against the Applicants' claimed invention.

Another significant feature of the Applicants' claimed invention that is not taught by the Baker patent is the required presence of a molecular sieve that is included in its hydrotreating catalyst. The sulphided, non-fluorided hydrodesulphurization catalyst that is defined in claim 1 is to contain a molecular sieve. But, on the other hand, Baker does not disclose or indicate that the support of its hydrotreating catalyst may contain any molecular sieve. *See* Baker at column 7, line 57 through column 9, line 12. Furthermore, Baker provides no details on the physical properties such as surface area, pore volume, or pore size of its hydrotreating catalyst. *See supra*.

As for the Examiner's combination of the secondary and tertiary references, there is nothing in any of the references that suggest their combination. But, even if the teaching of the references can be combined, no combination will provide a process as is claimed by the Applicants.

The recitation in claim 1 of the additional process step of separating the effluent that is yielded from the contacting step provides for additional distinctions over the cited prior art. The Baker patent teaches that its dewaxing step is carried out using a catalyst system comprising two catalysts that synergistically act together and that the preferred practice is for these catalysts to be contained in a single reactor vessel in the practice of the invention. The intermediate separating step of the Applicant's claimed invention provides additional differences over the teachings of the cited prior art.

In view of the amendments made to independent claim 1 and the many differences between this claimed subject matter and the teachings of the cited prior art, it is respectfully

submitted that independent claim 1, and the claims which depend therefrom, are patentably distinct over the prior art.

**§103(a) rejection of claims 4-7 and 12 over Baker, Jr. et al. (US 5,951,848) in view of Toba et al. in *Journal of Materials Chemistry* (1994, vol. 4, no. 7, pp 1131-1135) and Chen et al. (US 6,723,297) and further in view of Shimizu et al. in *Catalysis Today* (1998, vol 45, pp 271-276) and Speight in *The Desulfurization of Heavy Oils and Residua* (1999, CRC Press, 480 pgs).**

This rejection is rendered moot as a result of the amendments made to independent claim 1 from which claims 4-7 and 12 directly or indirectly depend and the comments made above. It is also noted that the Examiner has combined five references to support this rejection which, in itself, is evidence of the non-obviousness of the claimed subject matter.

**§103(a) rejection of claims 13-15 over Baker, Jr. et al. (US 5,951,848) in view of Toba et al. in *Journal of Materials Chemistry* (1994, vol. 4, no. 7, pp 1131-1135) and Chen et al. (US 6,723,297) and further in view of Shimizu et al. in *Catalysis Today* (1998, vol 45, pp 271-276) and Speight in *The Desulfurization of Heavy Oils and Residua* (1999, CRC Press, 480 pgs) and in further view of De Bont et al. in *Hperfine Interactions* (1998, vol 11, pgs 39-44).**

This rejection is rendered moot as a result of the amendments made to independent claim 1 from which claims 13-15 directly or indirectly depend and the comments made above. It is also noted that the Examiner has combined six references to support this rejection which, in itself, is evidence of the non-obviousness of the claimed subject matter.

**§103(a) rejection of claims 16-18 over Baker, Jr. et al. (US 5,951,848) in view of Toba et al. in *Journal of Materials Chemistry* (1994, vol. 4, no. 7, pp 1131-1135) and Chen et al. (US 6,723,297) and further in view of Shimizu et al. in *Catalysis Today* (1998, vol 45, pp 271-276) and Speight in *The Desulfurization of Heavy Oils and Residua* (1999, CRC Press, 480 pgs) and in further view of De Bont et al. in *Hperfine Interactions* (1998, vol 11, pgs 39-44) and in further view of Sequeira in *Lubricant Base Oil and Wax Processing* (1994, Marcel Dekker, 288 pgs).**

This rejection is rendered moot as a result of the amendments made to independent claim 1 from which claims 16-18 directly or indirectly depend and the comments made above. It is also noted that the Examiner has combined seven references to support this rejection which in itself is evidence of the non-obviousness of the claimed subject matter.

**§103(a) rejection of claims 19 over Baker, Jr. et al. (US 5,951,848) in view of Toba et al. in *Journal of Materials Chemistry* (1994, vol. 4, no. 7, pp 1131-1135) and Chen et al. (US 6,723,297) and further in view of Shimizu et al. in *Catalysis Today* (1998, vol 45, pp 271-276) and Speight in *The Desulfurization of Heavy Oils and Residua* (1999, CRC Press, 480 pgs) and in further view of De Bont et al. in *Hperfine Interactions* (1998, vol 11, pgs 39-44) and in further view of Sequeira in *Lubricant Base Oil and Wax Processing* (1994, Marcel Dekker, 288 pgs) and further in view of Chen et al. (US 4,919,788).**

This rejection is rendered moot as a result of the amendments made to independent claim 1 from which claim 19 directly or indirectly depends and the comments made above. It is also noted that the Examiner has combined eight references to support this rejection which, in itself, is evidence of the non-obviousness of the claimed subject matter.

## **Conclusion**

In view of the above, it is respectfully submitted that the now-pending claims 1-2, 4-7, and 12-19 are patentable. Thus, it is respectfully requested that the Examiner reconsider and withdraw his rejections and allow the pending claims.

Respectfully submitted,

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